

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1-14. (canceled)

15. (previously presented) A map creation device comprising:

a ground-information memory unit that stores a ground object expressing a three-dimensional shape of a ground;

a simple-ground-information creating unit that creates, based on the ground object, a simple ground object expressing the three-dimensional shape with less amount of data than the ground object;

an on-ground-structure-information creating unit that creates, based on the simple ground object, an on-ground-structure object expressing a three-dimensional shape of an on-ground structure that is present on a surface of the ground by adding height information to a two-dimensional on-ground-structure object expressing a two-dimensional shape of the on-ground structure; and

a map-information creating unit that creates map information in which the on-ground-structure object is superimposed on the ground object.

16. (previously presented) The map creation device according to claim 15, further comprising a two-dimensional-information memory unit that stores two-dimensional shape information including reference-line information indicating a reference-line of the two-dimensional shape of the on-ground structure, and width information indicating a width of the two-dimensional shape of the on-ground structure, the width in a direction perpendicular to the reference-line, wherein

the on-ground-structure-information creating unit creates the on-ground-structure object based on the two-dimensional shape information and the simple ground object.

17. (previously presented) The map creation device according to claim 15, wherein

the simple-ground-information creating unit creates three-dimensional polygon information as the simple ground object by adding, based on the ground object, height information to vertices of polygons in two-dimensional polygon information indicating a two-dimensional plane split into a plurality of polygons.

18. (previously presented) The map creation device according to claim 17, wherein the simple-ground-information creating unit sets a mean value of height information of the ground object present around the vertices as the height information of the vertices.

19. (previously presented) The map creation device according to claim 17, wherein the on-ground-structure-information creating unit creates the on-ground-structure object by adding height information to the two-dimensional on-ground-structure object, based on the height information of the vertices.

20. (previously presented) The map creation device according to claim 15, wherein the on-ground-structure-information creating unit extracts, from the simple ground object, height information at a specific position of the two-dimensional shape of the on-ground structure, and creates the on-ground-structure object by adding the extracted height information to the specific position.

21. (previously presented) The map creation device according to claim 20, wherein the map-information creating unit adjusts the extracted height information to add to the specific position.

22. (previously presented) The map creation device according to claim 15, further comprising a thickness-information memory unit that stores thickness information indicating a thickness of the two-dimensional shape of the on-ground structure in a height direction, wherein

the on-ground-structure-information creating unit creates the on-ground-structure object by adding the thickness information

to the two-dimensional on-ground-structure object.

23. (previously presented) The map creation device according to claim 22, wherein the map-information creating unit adjusts the thickness information to add to the two-dimensional on-ground-structure object.

24. (previously presented) A navigation device comprising:

a memory unit that stores at least one ground object expressing a three-dimensional shape of a ground;

a receiving unit that receives point information indicating at least one arbitrary point;

an extracting unit that extracts, from the ground object in the memory unit, a ground object expressing a three-dimensional shape of a ground within a predetermined range including the point information;

a simple-ground-information creating unit that creates, based on the extracted ground object, simple ground object expressing the three-dimensional shape with less amount of data than the extracted ground object;

a on-ground-structure-information creating unit that creates, based on the simple ground object, an on-ground-structure object expressing a three-dimensional shape of the on-ground structure that is present on a surface of the ground within the range including the point information by adding height information

to a two-dimensional on-ground-structure object expressing a two-dimensional shape of the on-ground structure;

a map information creating unit that creates map information in which the on-ground-structure object is superimposed on the extracted ground object;

a display-information creating unit that creates, based on the map information, map display information viewed from a view position corresponding to a position of the point information; and

a display unit that displays a map screen based on the map display information.

25. (previously presented) The navigation device according to claim 24, further comprising a route searching unit that searches a route between two points included in the point information, wherein

the on-ground-structure-information creating unit creates the on-ground-structure information so as to emphasize an on-ground-structure object corresponding to the route.

26. (currently amended) A map creation method comprising:
with an input unit, inputting a ground object expressing a three-dimensional shape of a ground;

with an extraction unit, creating, based on the ground object, a simple ground object expressing the three-dimensional shape with less amount of data than the ground object;

with a creating unit, creating, based on the simple

ground object, an on-ground-structure object expressing a three-dimensional shape of an on-ground structure that is present on a surface of the ground by adding height information to a two-dimensional on-ground-structure object expressing a two-dimensional shape of an on-ground structure; and

with a map unit, creating map information in which the on-ground-structure object is superimposed on the ground object,
wherein a programmed computer provides each of the input unit, the extraction unit, the creating unit, and the map unit.

27. (previously presented) A computer-readable recording medium that stores therein a computer program making a computer execute:

inputting a ground object expressing a three-dimensional shape of a ground;

creating, based on the ground object, a simple ground object expressing the three-dimensional shape with less amount of data than the ground object;

creating, based on the simple ground object, an on-ground-structure object expressing a three-dimensional shape of an on-ground structure that is present on a surface of the ground by adding height information to a two-dimensional on-ground-structure object expressing a two-dimensional shape of an on-ground structure; and

creating map information in which the on-ground-structure object is superimposed on the ground object.